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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,250	01/05/2007	Michio Watanabe	1794-0179PUS1	3050
2292 7590 10/08/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
DOYLE, JOHN				
ART UNIT		PAPER NUMBER		
2891				
NOTIFICATION DATE		DELIVERY MODE		
10/08/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/567,250

Applicant(s)

WATANABE ET AL.

Examiner

JOHN DOYLE

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 6-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 2/6/2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Claims 6-9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected micro tunnel-junction circuit, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 28 July 2009.

Applicant's election with traverse of claims 1-5 in the reply filed on 28 July 2009 is acknowledged. The traversal is on the ground(s) that the inventions must be independent or distinct as claimed; and there must be serious burden on the Examiner if the Restriction is not required. This is not found persuasive because the product as claimed can be made by another and materially different process; specifically, the narrow wall formed by a focused ion beam can be alternatively formed by an electron beam lithography.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

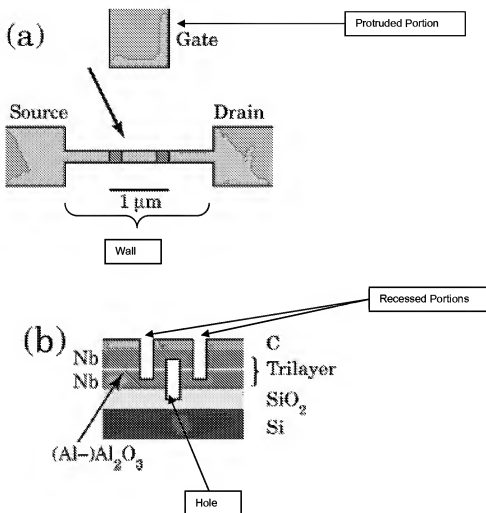
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Watanabe et al. (Applied Physics Letters, Vol. 84, No. 3, 19 January 2004)

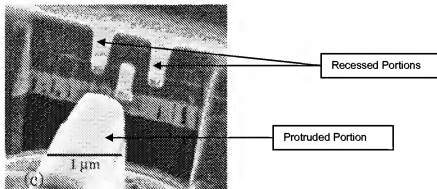
In re claim 1, Watanabe et al. disclose a method of manufacturing a micro tunnel-junction circuit, said method comprising the steps of: forming a three-layer structure (Fig. 1(b), i.e., Trilayer) by laminating a first metal (i.e., Nb), an insulator (i.e., Al_2O_3), and a second metal (i.e., Nb) on a substrate (i.e., SiO_2/Si) in this order; forming a narrow wall (as shown below, Fig. 1 (a)) part by milling said three-layer structure in the depth direction by using a focused ion beam (Page 410); and forming at least one laterally passed through-hole (as shown below, Fig. 1 (b)) in said wall part by using the focused ion beam (Page 410), and forming at least one recessed portion (as shown below, Fig. 1 (b)) positioned adjacent to said hole by milling the upper surface of said wall part in the depth direction, wherein said hole is a through-hole starting at the position of the head of the second metal to the position of the head of said structure, said recessed portion is formed to be recessed from the upper surface of said wall part into the first metal.



In re claim 2, Watanabe et al. disclose a method of manufacturing a micro tunnel-junction circuit, said method comprising the steps of: forming a three-layer structure (Fig. 1 (b), i.e., Trilayer) by laminating a first metal (i.e., Nb), an insulator (i.e., Al₂O₃), and a second metal (i.e., Nb) on a substrate (SiO₂/Si) in this order; forming a narrow wall (as shown above, Fig. 1 (a)) part by milling said three-layer structure in the depth direction by using a focused ion beam (Page 410); and forming a laterally passed through-hole

(as shown above, Fig. 1 (b)) in said wall part by using the focused ion beam (Page 410), and forming two recessed portions (as shown above, Fig. 1 (b)) positioned adjacent to said hole so as to sandwich said hole by milling (Page 410) the upper surface of said wall part in the depth direction, wherein said hole is a through-hole starting at the position of the head of the second metal to the position of the head of said substrate, and said two recessed portions are formed to be recessed from the upper surface of said wall part into the first metal.

In re claim 3, Watanabe et al. disclose a method, further comprising: forming a protruded portion (as shown below, Fig. 1 (c)) by milling (i.e., focused ion beam) said three-layer structure in the depth direction by using the focused ion beam at a position adjacent to said wall and facing said hole and said two recessed portions.



In re claim 4, Watanabe et al. disclose a method, wherein said first metal and said second metal are niobium (as shown above, Fig. 1 (b)).

In re claim 5, Watanabe et al. disclose a method, wherein xenon fluoride gas is introduced when processing is performed by using said focused ion beam (Page 412).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN DOYLE whose telephone number is (571)270-7879. The examiner can normally be reached on Monday-Thursday 7:30 AM-6:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kiesha Rose can be reached on (571)272-1844. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JOHN DOYLE
Examiner
Art Unit 2891

/JOHN DOYLE/
Examiner, Art Unit 2891

Art Unit: 2891

/Kiesha R. Bryant/

Supervisory Patent Examiner, Art Unit 2891